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INSECTS IN RELATION
TO
NATIONAL DEFENSE

Circular 10

BEDBUGS



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NATIONAL DEFENSE

Circular 10 - Bedbugs

The mature, well-grown bedbug is a wingless, brown insect between one-fourth and three-eighths of an inch long. When unfed it is very flat and shaped as shown in Fig. 1 a. When engorged with blood, the body loses its paper-thin appearance and becomes more elongated and swollen, as shown in Fig. 1 b; and the blood within its body gives it a more reddish appearance. The food of bedbugs is the blood of warm-blooded animals, principally man.



Figure 1 - Mature bedbug: a. before feeding; b. after becoming engorged with blood.

HOW BEDBUGS FEED UPON MAN

Bedbugs are sucking insects. Their mouth parts are so constructed as to form a sharp beak, or proboscis, which can be thrust into the skin and through which blood of its victim can be drawn. It requires a continuous feeding of from 3 to 5 minutes for a well-grown bedbug to become engorged with blood. Once filled to capacity, the bug withdraws its beak and quickly crawls to its hiding place where it remains for several days digesting its meal, seemingly indifferent to its host. When hunger finally reasserts itself, the bedbug comes out of hiding and seeks out its host for another meal.

WHEN BEDBUGS FEED

Bedbugs are normally nocturnal in habit. When darkness arrives, they emerge from their daytime hiding places and seek to feed upon their host. Sometimes, when very hungry, they will feed in subdued light during the daytime. Their normally nocturnal habit is modified when they infest furniture in rest rooms, in stores, theatre seats, desks in offices, and similar situations that are not frequented by man throughout the night. In such places bedbugs often bite persons during the day.

HOW BEDBUGS ARE DISTRIBUTED

Bedbugs are distributed in many ways. They crawl freely to their victims from and to their hiding places, but do not move freely from room to room, or from building to building, as many believe. Probably clothing, baggage, secondhand furniture, laundry done in private infested homes, and visitors are the chief means of spread. At army camps bedbugs are often brought in the baggage of new arrivals.

NORMAL DEVELOPMENT

The mature female bedbug, under favorable conditions, is said to live from 6 to 8 months, and has been

known to lay as many as 541 eggs, although 200 eggs is probably a fair average. When temperature and food conditions are favorable, eggs are laid at an average rate of 3 or 4 a day. No eggs are laid at temperatures lower than 50°F., and very few between 50° and 60°, while maximum oviposition occurs only above 70° and when the female has ample opportunity to feed. Starved females soon stop laying eggs.

At temperatures above 70°F. the eggs hatch in 6 to 17 days. At lower temperatures they may not hatch for 28 days. The eggs are white, about one thirty-second of an inch long, are shaped as indicated in Fig. 2, and at first are coated with a mucilaginous substance which forthwith dries, sticking them to the



Figure 2 - Milky-white egg shells of bedbug.

object upon which they are deposited. The unhatched eggs and the milky-white egg shells are seen singly or in clusters about the crevices or hiding places where bedbugs congregate.

The newly hatched translucent and nearly colorless young bedbug feeds at the first opportunity. During growth the young bedbug closely resembles the parent insect. It molts, or sheds its skin, 5 times in reaching maturity. It must feed after each molt in order to grow and molt again. The cast skins are white and fluffy and often accumulate in piles in cracks of bedsteads, in spaces about window and door frames, behind wall pictures, or any other place where the bedbugs hide during the daytime. Full nymphal growth requires from 4 to 6 weeks during warm summer weather or in houses continuously heated. There may be three or four generations, or even more, a year in warm climates. Generations overlap, and all stages may be present at all seasons of the year. In unheated buildings, bedbugs overwinter mostly as adults.

CONTROL

In combating bedbugs, first find where they are hiding. When first established in a room, they are likely

to hide about the tufts or seams of the mattress, later in the cracks and crevices of the bedstead. In the case of metal army cots, they often hide in the hollow interior of the frame. Upon becoming more numerous, or after being fought, the bedbugs become scattered and establish themselves behind baseboards, window and door casings, pictures, picture moldings, loosened wallpaper, or in cracks in plaster. Partitions of composition board are ideal for bedbugs, for usually there are many cracks about the unions in which bugs can hide or through which they can retreat to the wall space. Bedbugs do not crawl far into wall spaces for hiding to any great extent. They hide usually on a flat surface just away from the bright light. Habitual hiding places are usually made evident by the disfiguring spots that stain surfaces upon which the bugs rest (Fig. 3). Hiding

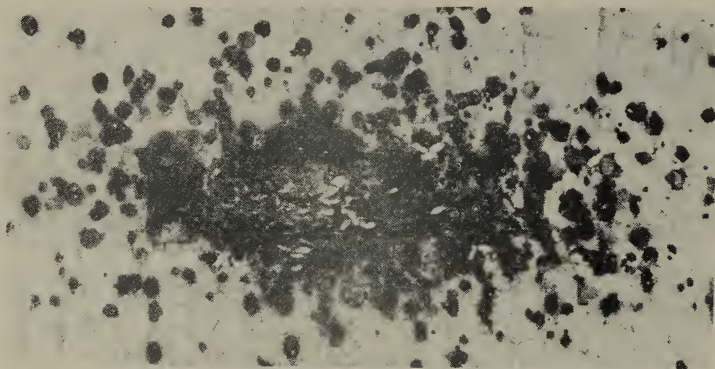


Figure 3 - Characteristic brown or black excretal specks found where bedbugs hide during the daytime.

places are usually close to the beds and easily detected. Frequent inspection of beds by an experienced inspector will detect the presence of a few bugs and permit application of control and prevent infestation from becoming serious.

Fumigation

There is no better way to stamp out an infestation quickly than by fumigation. Fumigations of 6 to 12 hours

duration with hydrocyanic acid gas generated from 1 pound of sodium cyanide per each 1,000 cubic feet of space have given excellent results in most barracks. Trained personnel with professional experience should be employed for the use of this excellent but deadly poisonous gas. Fumigation can be made thoroughly effective and does away with the messiness and disagreeable features of spray applications. Most buildings can be safely fumigated if detached and separated from other buildings by a distance of 15 to 20 feet. They must be completely vacated and guarded during fumigation and until thoroughly ventilated. In no case should fumigation with hydrocyanic acid gas be undertaken by persons untrained in its use. For directions see Circular No. 22.

Superheating

Heating rooms or entire buildings to a temperature of 120° to 125°F. for one hour will kill bedbugs. It usually requires from 10 to 12 hours to secure a killing temperature in all parts of the various rooms of a structure when ordinary heating equipment is available. Superheating has been resorted to with success during hot summer weather when advantage can be taken of the normally prevailing high temperatures. The length of time required for the heat treatment varies with the heating equipment. Thermometers should be placed in various parts of the room to make certain that the proper temperatures are secured. Bedbugs in hollow interiors of metal bedsteads can be killed by heating the metal with a blow torch where this drastic control is feasible.

Sprays

Where fumigations and superheating are not possible, the application of spray liquids can be used effectively. Ordinarily, sprays must be applied several times before complete relief is secured. They must be brought into contact with the various stages of the bedbug to effect a kill. The mere casual or haphazard applications do very little good. Sprays generally used consist very largely of a light mineral oil with small additions of pyrethrum extract. These sprays are readily available on the market under various trade names and are frequently referred to as fly sprays. Sprays are best applied

with power sprayers operated with electricity, and such spray equipment is recommended for large barracks where trouble with bedbugs is a recurring one and where an experienced operator is present. Ordinary cheap hand sprayers, such as can be purchased at stores for \$0.25, can be made a satisfactory means of applying liquids provided the user understands where the bedbugs are hiding and takes the necessary care to see that the spray is directed to these spots.

Individual Action in Controlling Bedbugs on a Bed

Sometimes beds become infested in situations where it is difficult to get prompt official action, and it is desirable that the individual do something about his own bed. He should first pull his cot away from the wall so that no part of the frame touches the side walls. The legs can then be set in shallow dishes of kerosene after which the bed should be stripped, thoroughly sprayed with a hand sprayer, or in the absence of such sprayer, all cracks and crevices should be treated with kerosene or a proprietary bedbug solution applied with a small brush or large feather, with special reference to minute cracks. This done, the bed should be made up with freshly laundered and well brushed bedding which should be so arranged that it will not touch the floor or walls.

REFERENCE

Back, E. A. -- 1937 -- Bedbugs. U. S. Dept. of Agriculture Leaflet 146.
